

NAVAL WAR COLLEGE  
Newport, R.I.

COMMAND AND CONTROL OF JOINT THEATER MISSILE DEFENSE FORCES

by

John F. Steinberger

Lieutenant Commander, U. S. Navy

A paper submitted to the faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

**DISTRIBUTION STATEMENT A**

Approved for public release;  
Distribution Unlimited

Signature: \_\_\_\_\_

13 February 1997

19980709 009

DTIC QUALITY INSPECTED 1

REPORT DOCUMENTATION PAGE

1. Report Security Classification: UNCLASSIFIED			
2. Security Classification Authority:			
3. Declassification/Downgrading Schedule:			
4. Distribution/Availability of Report: DISTRIBUTION STATEMENT A: APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.			
5. Name of Performing Organization: JOINT MILITARY OPERATIONS DEPARTMENT			
6. Office Symbol: C		7. Address: NAVAL WAR COLLEGE 686 CUSHING ROAD NEWPORT, RI 02841-1207	
8. Title (Include Security Classification): COMMAND AND CONTROL OF JOINT THEATER MISSILE DEFENSE FORCES (U)			
9. Personal Authors: LCDR John F. Steinberger, USN			
10. Type of Report: FINAL		11. Date of Report: 13 FEBRUARY 1998	
12. Page Count: 17			
13. Supplementary Notation: A paper submitted to the Faculty of the NWC in partial satisfaction of the requirements of the JMO Department. The contents of this paper reflect my own personal views and are not necessarily endorsed by the NWC or the Department of the Navy.			
14. Ten key words that relate to your paper: TMD, TBMD, BALLISTIC, MISSILES, AADC, JFACC, JOINT, AIR DEFENSE, COMMAND AND CONTROL, THEATER			
15. Abstract: Current Joint Doctrine allows the Joint Force Commander a great deal of flexibility in establishing the theater missile defense command and control relationships. The guidance also suggests that the JFACC, if assigned should control these forces through the AADC. While the Area Air Defense Commander must be the commander of choice for theater missile defense, the relationship with JFACC should be separate and equal.			
16. Distribution / Availability of Abstract:	Unclassified  X	Same As Rpt	DTIC Users
17. Abstract Security Classification: UNCLASSIFIED			
18. Name of Responsible Individual: CHAIRMAN, JOINT MILITARY OPERATIONS DEPARTMENT			
19. Telephone: 841-6461		20. Office Symbol: C	

Abstract of

COMMAND AND CONTROL OF JOINT THEATER MISSILE DEFENSE FORCES

Current Joint Doctrine allows the Joint Force Commander a great deal of flexibility in establishing the theater missile defense command and control relationships. The guidance also suggests that the Joint Force Air Component Commander, if assigned, should control these forces through the Area Air Defense Commander.

While the Air Defense Commander must be the commander of choice for theater missile defense, the relationship with the JFACC should be separate, but equal. Here is where the true flexibility implied in the Joint Doctrine resides. The Joint Force Commander should have the flexibility to choose among several choices for his AADC. This choice should be dependent on the current situation, and the JFC should be able to shift duties as events warrant. Possible changes include stage of the war, threat, arrival of forces in theater, etc. To allow the JFC this option, all theater missile defense forces must be capable of assuming duties as AADC. Several doctrinal issues are discussed that will facilitate this flexibility to include inter-operability and manning issues.

## Table of Contents

	<u>PAGE</u>
Abstract . . . . .	ii
Introduction . . . . .	1
U.S. Current And Near Term TBMD Capabilities . . . . .	2
The Threat . . . . .	4
Doctrinal Backdrop . . . . .	5
Why Not JFACC? . . . . .	8
Can TMD Go Joint? . . . . .	10
Proposed Doctrine . . . . .	12
Bibliography . . . . .	14

## INTRODUCTION

The Theater Missile (TM) threat is a worldwide reality that the operational level commander must consider. TM's were brought to the forefront of everyone's priority list during Desert Storm. The systems to combat TM's, such as Patriot and AEGIS, fast became hot programs into which apparently limitless funding was flowing. Theater Ballistic Missile Defense (TBMD) has come into its own maturity and, as such, is being closely scrutinized. All of the efforts to date have been mostly service specific with little focus on joint operations. The Ballistic Missile Defense Organization (BMDO) and the Joint Chiefs of Staff are addressing these issues now. Joint Publication 3-01.5, *Doctrine for Joint Theater Missile Defense* and the follow on publication, Joint Pub 3-01, *Countering Air and Missile Threats* (draft), begin our attempt to manage this complex issue, but do more to obfuscate, rather than bound the problems. The command and control relationships and hierarchical, service specific ideologies stated therein do not adequately prepare the commander to field, much less fight, his forces. This paper will recommend an avenue of approach to facilitate joint missile defense, specifically asserting that the Area Air Defense Commander (AADC), separate and distinct from the Joint Force Air Component Commander (JFACC), must retain the responsibilities for TMD under the Joint Force Commander (JFC). Further, each service with a role in TMD, *to include coalition forces in developed theaters*, must be prepared to function as an AADC in the Joint Force architecture. Exact employment and assignment will be extremely situational in nature and will be dependant upon the overlapping of coverage areas and arrival of additional forces into theater.

## **U.S. CURRENT AND NEAR TERM TBMD CAPABILITIES**

This section is intended to familiarize the reader, in broad terms, with the U.S. capabilities as currently fielded or in development. We will focus on active defense systems and C<sup>4</sup>I systems (to include space-based ) only. Further information will be available through references in the Bibliography.

The Army Patriot System is our only current active defense weapon. It is primarily for local area defense. An upgrade (Patriot Advanced Capabilities, phase three-PAC 3) is due out shortly that will increase the range and lethality of Patriot. The Army is also working on Theater High Altitude Area Defense (THAAD) system. This would provide area coverage in the endo- and exo-atmospheric regions, the so-called upper tier area encompassing post-boost and mid-course missile flight. There have been indications that THAAD has had several failures during testing and may be cancelled.

The Navy has leveraged its success in the AEGIS weapons system and SPY-1 radar by making them the basis for the Navy Area TBMD System. This will provide a lower tier capability. The centerpieces for this will be the AN/SPY-1 phased array, 360 degree radar and the SM-2 Block IV-A , extended range standard missile. Initial Operational Capability (IOC) is expected in FY99.

All other active defense weapons are in varying stages of the advanced concepts phase. They are all geared towards different intercept points along a TMD's flight profile, striving for theater wide defense in depth.

The Joint Data Network (JDN) is the primary command and control system used for the high speed transfer of time critical track and C<sup>2</sup> data. It is primarily a collection of nets and data transfer standards. The JDN is made up of the following:

- Tadil A/Link 11
- Tadil J/Link 16
- TIBS
- TDDS
- SAT/EHF/UHF/VHF/HF Voice circuits<sup>1</sup>

Currently, space-based TBM launch detection is done by Defense Support System (DSP) satellites. There are three complementary systems dedicated to the processing of DSP tactical data, namely the Joint Tactical Ground Station (JTAGS), Attack and Launch Early Reporting to Theater (ALERT) and Tactical Data and Reporting (TACDAR) system. USSPACECOM operates these systems as an integrated missile data dissemination system known collectively as the Theater Event System (TES).<sup>2</sup>

The Space Based Infrared System (SBIRS) is a new constellation of high and low orbit satellites that when fully fielded will be capable of detecting, tracking and reporting

---

<sup>1</sup> Ballistic Missile Defense Organization, Theater Missile Defense System Description Document, (Washington D.C.: June 3, 1996).

<sup>2</sup> Joint Chiefs of Staff, Joint Theater Missile Defense Conops (Draft) (Washington, D.C.: February 17, 1995), 29-32.

on ballistic missiles in all phases of flight.<sup>3</sup> IOC of the low Earth orbit satellites is expected in FY99.

## THE THREAT

Theater Missiles (TMs) may be a ballistic missile, a cruise missile, or an air-to-surface missile...whose target is within a given theater of operations.<sup>4</sup> Theater ballistic missiles are typically classified by short (300 kilometers or less), medium (300 to 900 kilometers), and long (greater than 900 kilometers) range. Table 1 provides a representative sample of prevalent theater ballistic missiles and associated countries.<sup>5</sup> These weapons primarily have conventional warheads. They are also capable of delivering Weapons of Mass Destruction (WMD), the euphemism for chemical, biological and nuclear payloads. This capability has made even the short range ballistic missile a significant force multiplier, truly capable of shaping the tactical, operational, and strategic battlefields. Further specifics on the threats are not required for the understanding of the focus of this paper. Again, additional reference material is provided in the Bibliography. What needs to be taken away is that these weapons are relatively inexpensive and present in every major Area of Responsibility (AOR).

---

<sup>3</sup> Ballistic Missile Defense Organization, Theater Missile Defense System Description Document, (Washington D.C.: June 3, 1996), 49

<sup>4</sup> Joint Chiefs of Staff, Doctrine for Joint Theater Missile Defense (Joint Pub 3-01.5) (Washington, D.C.:February 22, 1996), vii.

<sup>5</sup> Joint Chiefs of Staff, Joint Theater Missile Defense Conops (Draft) (Washington, D.C.:February 17, 1995), 9



Table 1. Representative sample of Countries and TBM capability.

COUNTRY	300 km	300 - 900 km	900 - 1,200 km
China	M-11	M-9	unknown
Egypt	Scud B	Scud C	Vector
Iran	Scud B	Scud C	
Iraq	Scud B	Scud C, Al Hussein	Al Abbas, Badr 2000
North Korea	Scud B	Scud C	No Dong 1
Pakistan	M-11, Hatf 2		

## DOCTRINAL BACKDROP

The underlying structure of the TMD mission area was provided by the JCS Mission Needs Statement (MNS) for TMD: "to protect U.S. forces, U.S. allies, and other important countries, including areas of vital interest to the United States, from theater missile attacks."<sup>6</sup> This then led to the TMD doctrine currently found in JCS Pub 3-01.5.

There are four pillars that comprise the operational components of TMD: passive defense, active defense, attack operations, and command, control, communications, computers, and intelligence (C<sup>4</sup>I). Passive defense includes measures to reduce the vulnerability of civilians and military forces and minimize the effects of attack. This includes limiting enemy target acquisition capabilities, counter-surveillance, hardening, early warning, mobility, electronic warfare, and chemical, biological, and radioactive (CBR) protection. Active defense operations concentrate on destroying airborne launch platforms and missiles in flight. Engagement capability is required throughout every phase of the missile flight (boost, post-boost, mid-course, and terminal). This defense in depth is needed to ensure point defense systems are not overwhelmed and to minimize warhead

---

<sup>6</sup> Ibid., 2

effects. Active defenses can/will consist of space, air, sea, and ground based systems. Currently, the Army has the preponderance of active defense capability in the Patriot weapon system. This is primarily a point defense, limited area system. Attack operations, or *Scud Hunting* as it came to be called, is focused on interdicting the enemy's ability to launch a TM by attacking all elements of the overall system. Targets include Transporter, Erector, Launchers (TELs), weapons stock piles, support facilities, and C<sup>4</sup>ISR sites/nodes. Attack operations can be conducted by space, air, sea, ground and special operations forces. C<sup>4</sup>I includes all methods and systems used to coordinate and integrate joint force capabilities throughout the entire spectrum of TMD.<sup>7</sup> Specifically:

- Conduct intelligence Preparation of the Battlespace in order to assess the most likely area of operations for enemy TM forces and focus intelligence collection efforts.
- Using all assets to conduct area wide surveillance to provide cueing and target discrimination.
- Rapidly and accurately disseminate data to facilitate active defense and attack operations and to allow time sensitive implementation of passive defense actions.
- Expedite rapid counter attacks.
- Accurate and timely Battle Damage Assessment.<sup>8</sup>

The description of this relationship as pillars has helped along the doctrinal difficulty we now find ourselves in. This is nowhere more apparent than in the area of attack operations. During Desert Storm this relatively new mission was almost exclusively the purview of the attack aircraft, hence the Joint Force Air Component Commander (JFACC), hence the Air Force. The Air Force then reasoned that this was their entre into having JFACC lead the entire TMD mission. This was bolstered by the association of air

---

<sup>7</sup> Joint Chiefs of Staff, Doctrine for Joint Theater Missile Defense (Joint Pub 3-01.5) (Washington , D.C.:February 22, 1996), viii.

defense operations with the AADC and the predominant belief that JFACC and AADC were synonymous or that AADC was subordinate to JFACC (this was greatly facilitated by the Navy's refusal to play in the joint sandbox with everyone else, but that is another story..).<sup>9</sup> One reason for this line of thought is that we have not faced a credible air threat in quite some time, therefore the role of AADC has been secondary (and in some cases *seconded*) to JFACC and his attack missions. This then is at the heart of the current doctrinal dilemma: Who is responsible for theater missile defense?

The Air Force obviously wants JFACC to control TMD operations along the same doctrinal lines they control theater air defense (TAD). The Army has a definite view in this matter since they *are* active defense (for the moment, anyway). The feeling being that air power is insufficient and ineffective against ballistic missiles, the Army would prefer to run the TMD problem, specifically with as little JFACC control as possible.<sup>10</sup> The Navy might very well have the preponderance of TMD, specifically TBMD, assets in the near future and has been practicing JFACC functions aboard aircraft carriers for some time now. Further, AADC systems are being envisioned for retrofit on AEGIS cruisers specifically to allow the command and control of TMD.<sup>11</sup> More is at stake than funding for service specific programs. The traditional, service-specific standards and hierarchical relationships for air and missile defense are in jeopardy.

The current joint doctrine for TMD allows the joint force commander the flexibility in establishing the command relationships in his own structure to support TMD. In support of this, the services are developing command and control centers that are capable of integrating into the existing theater architecture. The trap that the joint doctrine has set, however, is in recognizing a duality between the JFACC and the

---

<sup>8</sup> Joint Chiefs of Staff, Joint Theater Missile Defense Conops (Draft) (Washington, D.C.:February 17, 1995), 2-4

<sup>9</sup> Daniel Augustine, "Theater Missile Defense: A Primer for the Uninitiated," Unpublished paper of the U.S. Naval War College, June 13, 1997, 19-20.

<sup>10</sup> Ibid., 16

<sup>11</sup> Steve Kreutner and Richard Hagy II. "Forward Deployed, Flexible, and Independent." Surface Warfare Magazine, May/June 1997, 31

AADC.<sup>12</sup> To paraphrase, the doctrine states that the joint force commander normally assigns TMD duties to an AADC, *however*, if a JFACC is assigned then the joint force commander may also assign AADC duties to the JFACC. This presents two problems: The duality of JFACC and AADC and JFACC's involvement in active TMD.

## WHY NOT JFACC?

The JFACC and AADC discussion must begin on a level playing field. Table 2 illustrates the functions of the JFACC and AADC.

Table 2. AADC and JFACC Functions.<sup>13</sup>

	AADC	JFACC
<b>PLANNING</b>	<ol style="list-style-type: none"> <li>1. Produce Active Defense Plan</li> <li>2. Assign Missions</li> <li>3. Develop Control Procedures</li> <li>4. Integrate TMD and TAD active Defense Plans.</li> <li>5. Recommend ROE.</li> </ol>	<ol style="list-style-type: none"> <li>1. Develop Air Campaign Plan.</li> <li>2. Develop Target List</li> <li>3. Assign Missions.</li> <li>4. Apportion Air Assets.</li> <li>5. Develop Air Tasking Order</li> </ol>
<b>COORDINATING and EXECUTING</b>	<ol style="list-style-type: none"> <li>1. Change Missions/Priorities.</li> <li>2. Coordinate TAD and TMD engagements.</li> </ol>	<ol style="list-style-type: none"> <li>1. Change Missions/Priorities</li> <li>2. Coordinate offensive and Defensive Air Operations</li> <li>3. Deconflict Airspace</li> <li>4. Provide Close Air Support.</li> </ol>

<sup>12</sup> Charles Anderson and Richard Kurtz, "Who's in Charge?" Air Defense Artillery, July-August 1996, 4

<sup>13</sup> Ibid., 6

The JFACC is extremely busy. His primary tasks of producing and supervising the air tasking order and the joint target list are significant, repetitive, time-consuming tasks. The role of counter-air operations supervision is generally delegated to the control and reporting center (CRC) level, where the focus is on air-to-air operations. The question to be asked is whether the JFACC has the time or mechanism to adequately focus on active TMD and the associated attack operations and passive defense procedures.

The Air Force tends to view the AADC role as transitory in nature.<sup>14</sup> They view the AADC as a procedure rather than as a commander. In several exercises, the AADC function existed long enough to develop an active defense plan, then the execution of that plan was delegated to the CRC and JFACC became the dominant foci. The CRC relegates ground based surface-to-air defenses as secondary to air-to-air and the plan as envisioned by the AADC has no chance of being executed as foreseen.<sup>15</sup> In a joint (combined?) TMD environment, near real-time decisions are absolutely necessary based on the relative speeds of the threats involved. In the JFACC/CRC scenario, a CRC, probably distant from the JFACC might be responsible for difficult force assignment decisions. If there is loss of coverage in TMD during a battle, the CRC must attempt to fill it. An example could be an AEGIS cruiser being ordered to a sector to plug the loss of coverage. If that ship is involved as a Tomahawk strike platform or as a carrier escort, then who will make the final decision? I do not see this decision authority being left at the CRC level. Also, in a large Area of Operations, there may be several CRC's established.<sup>16</sup> That will certainly dilute the authority and complicate the command and control of TMD forces.

Finally, in a joint or combined theater there may be a significant amount of overlapping coverages. This will be even more likely in the future as we strive for defense in depth for TBMD as well as TMD. This will require considerable deconfliction, pre-planned and real-time battle management that will necessitate a full time AADC.

#### **TMD AND THEATER AIR DEFENSE (TAD)**

---

<sup>14</sup> Ibid., 4

<sup>15</sup> Ibid., 5

<sup>16</sup> Ibid., 5

While there are some reservations to JFACC suborning the AADC/TMD role, we must consider JFACC's TAD mission in any discussions of TMD. Active defense TMD systems are integrated into the C<sup>4</sup>I architecture that supports TAD. Likewise some active defense systems are capable of conducting TAD missions (e.g., versus manned aircraft). Depending on a variety of factors including stage of the war, status of air superiority, etc., TMD assets could be called upon to function in an air defense role.<sup>17</sup> This clearly indicates the need for superior coordination and control of joint forces. Enemy cruise missiles need to be distinguished from returning friendly attack aircraft, U.S. cruise missiles may be routed over friendly territory, and some cruise missiles can be engaged by manned aircraft. There can be no doubt that active defense operations and air defense operations are inexorably coupled. Further, while TMD is a one of the few growth industries in the military right now, fiscal and budgetary concerns can never be ignored. These considerations will never permit the building of separate, stovepipe command and control and weapons systems for TAD and TMD.

### CAN TMD GO JOINT?

A few points on TMD:

- Air defense command and control schemes already exist, and have for some time. These are a natural starting place for planners to formulate TMD requirements. There is no reason to continue inventing the wheel.

- There must be unity of command of air defense/active TMD forces. Further, the commander must be able to exercise *tactical* control of the assigned forces.<sup>18</sup>

---

<sup>17</sup> Joint Chiefs of Staff, Joint Theater Missile Defense Concepts (Draft) (Washington, D.C.:February 17, 1995), 13-14.

<sup>18</sup> James A. Winnefeld and Dana J. Johnson, Command and Control of Joint Air Operations: Some Lessons Learned From Four Case Studies of an enduring Issue, (Santa Monica, CA.: Rand, 1991) 58

-The guiding principle for command doctrine should be centralized control, de-centralized execution. However, the method of tactical control will vary and should be assessed based upon several factors including:<sup>19</sup>

- Threat
- Forces available
- Mission
- Defense scheme
- Factor space (maritime, land, littoral)
- degree of overlapping coverage

In the true joint environment that we are striving to achieve there will be no place for traditional hierarchical relationships, because those were built largely on information flow. The senior would task the subordinate based on information not available to the subordinate. With the continued improvement of the Joint Data Network, all elements of a joint architecture will have the same information and can act independently based upon previously established procedures.

Dedicated and sustained inter-operability is the key to achieving the type of control described above. Specifically, inter-operability must focus on three areas:

- Communications. Service command and control centers must be able to communicate with all other services seamlessly and near instantaneously. This capability must be built into the systems from the ground up, and not require last minute field changes or modifications. An Aegis ship should be able to with an AWACS and a Patriot site just as easily as with another Aegis ship (maybe easier!!). This than allows

---

<sup>19</sup> Charles Anderson and Richard Kurtz, "Who's in Charge?" Air Defense Artillery, July-August 1996, 7

all the players to share the same tactical air picture and fosters situational awareness.

- **Weapons Systems.** If the weapons systems were able to interact and maintain a common 'database' they could possibly achieve real-time target coordination preventing multiple, unplanned engagements on single targets.
- **Early Warning.** The swift and simultaneous receipt of launch indications directly supports attack operations, active defense and most directly, passive defense. This means that all players, not just the specially configured flagship, should have simultaneous access to space based warning systems.

## **PROPOSED DOCTRINE**

The role of the JFACC must be culled from the Theater Missile Defense arena. The Joint Force Commander must be able to assess the situation and take the previously mentioned factors into consideration and then select his AADC and assign forces to him. This places responsibility on all services component missile defense forces to be trained and capable of assuming duties as AADC. The situation must dictate the Joint Force Commanders choice of AADC, not traditional, unyielding dogma. The AADC must be supported, and augmented as necessary, by experts from all services. The AADC must have tactical control of his active defense forces. This control should be guided by the precept of centralized control, de-centralized execution. Pre-planning and adherence to joint tactics, techniques and procedures will be cornerstones to successful execution, all predicated on a seamless and timely exchange of information.

The current technology boom and the prevalence of the theater missiles has necessary altered the battlespace and the way we fight. Traditional, hierarchical command



and control architectures cannot adapt to the rapidly changing face of warfare. We need an adaptive doctrine that takes advantage of our superiority in technology and emphasizes flexibility for the Joint Force Commander. This requires a separate commander, trained staff, applicable joint doctrine, and an interoperable defense force to adequately provide defense throughout a theater.

## BIBLIOGRAPHY

- Anderson, Charles A. and Kurtz, Richard G. "Who's in Charge." Air Defense Artillery, July-August 1996, 2-8.
- Ballistic Missile Defense Organization, Theater Missile Defense System Description Document, Washington D.C.: June 3, 1996.
- Brooks, Robert J., "Joint Command and Control - Search for the Holy Grail." Unpublished Research Paper, U.S. Air University, Air War College, Maxwell, AL: 1988.
- DeAntona, Joe, "Theater Missile Defense: Building Synergy for the Operational Commander." Unpublished Research Paper, US Naval War College, Newport RI: February 4, 1997.
- Evers, Stacey. "Fragmented Efforts Can Damage TMD." Army, December 1993, 31-33.
- Kreutner, Steve and Hagy, Richard E. II, "Naval Theater Ballistic Missile Defense: Forward Deployed, Flexible and Independent." Surface Warfare Magazine, May/June 1997, 27-31.
- O'Neill, Malcolm R., "Ballistic Missile Defenses: Paths of Protection." Defense 95, May June 1995, 15-26.
- U.S. Joint Chiefs of Staff. Doctrine for Joint Theater Missile Defense (Joint Pub 3-01.5) Washington, D.C.: February 22 1996.
- \_\_\_\_\_. Doctrine for Joint Operations (Joint Pub 3-0) Washington, D.C.: February 1 1995.
- \_\_\_\_\_. Joint Doctrine for Command and Control Warfare (Joint Pub 3-13.1) Washington, D.C.: February 7, 1996.
- \_\_\_\_\_. Joint Theater Missile Defense Conops (Draft) Washington, D.C.: February 17, 1995.
- \_\_\_\_\_. Joint Doctrine for Command, Control, Communications, and Computer (C4) Systems Support to Joint Operations (Joint Pub 6-0) Washington, D.C.: May 30, 1995.
- Winnefeld, James A. and Johnson, Dana J. Joint Air Operations: Pursuit of Unity in Command and Control 1942-1991. Annapolis MD: Naval Institute Press, 1993.
- \_\_\_\_\_. Command and Control of Joint Air Operations: Some Lessons Learned From Four Cases of an Enduring Issue. Santa Monica CA: Rand, 1991